



# Turbine Forum 2023 Technical Workshop

WITH DR. THOMAS GARTNER & DR. WARREN MIGLIETTI

## Objective

The objective of the workshop is to explain to the attendees the importance of the different technologies utilized in the repair of gas turbine engine components and to explain why they degrade and how they are repaired.

## Key Topics

- Aviation & Industrial Gas Turbine Aspects
- Gas Turbine Operation
- Degradation Modes
- Materials
- Coatings
- Coating Removal & Reapplication
- Welding
- Diffusion Brazing
- Heat Treatment
- Benefits of HIP'ing
- Additive Manufacturing

## INTRODUCTION



Gas turbine engine components degrade in a hostile environment, but repair of these expensive components is a booming industry. The pre-Turbine Forum workshop will discuss the principles of gas turbine operation, materials, coatings, deterioration of engine components, repair solutions, and preventive measures. It will also cover how to remove protective coatings, manual and automated weld repairs, braze repairs, and the role of heat treatments in enhancing efficacy. Finally, reapplying protective coatings and the family of coatings will be discussed.

## WHO SHOULD ATTEND?



Users/Operators of gas turbine engines as well as repair shop engineers and personnel, process Engineers dealing with many repair technologies described above will benefit since both presenters have over 65+ years of experience between them. **Lastly, one is never too old to learn something.**



Users &  
Operators



Repair & Process  
Engineers



Anyone  
Interested in Gas  
Turbines!

## BENEFITS



### Tailored to the Attendees

1

This workshop will also be interactive so that participants can get the most benefit, and different sections will be highlighted based on the needs of the audience.

### Immense Expertise

2

Both presenters have over 65+ years of experience between them.

### Real Life Application

3

Attendees are also welcome to bring with them case studies or actual hardware to discuss first-hand how the component can be effectively repaired.



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125 Front Street, Worcester MA, 01608

# Technical Workshop (Potential\*) Agenda

\*TAILORED TO AUDIENCE NEEDS

## ENGINE TECHNOLOGY | 9:00A

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- Materials utilized in the cold (compressor) section and hot (turbine) section
- The strengthening mechanism for the materials used in the engine
- Composite materials
- Specific strength
- Coating systems

## MOTIVATION FOR REPAIR | 10:00A

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- Material Solutions
- Customer benefits

## COFFEE/ TEA BREAK | 10:30A

## COMPONENT DEGRADATION & REPAIR SCHEMES | 11:00 A

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- LPC / HPC Airfoils
- HPT Blades and Vanes
- LPT Airfoils
- Sealing Systems
- Case / Housings

## FATIGUE DAMAGES | 12:00 P

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- HPC Airfoils
- HPT Airfoils
- Tubes

## LUNCH | 12:30P

## REPAIR PROCESSES | 1:30P

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- Coating removal
- Manual welding
- Automated welding inclusive of laser cladding
- FIC (fluoride ion cleaning)
- Diffusion Brazing
- Heat treatment
- HIP'ing

## COFFEE/ TEA BREAK | 3:00P

## REPAIR PROCESSES CONT. | 3:30P

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- 3D Printing (Additive Manufacturing)
- Coating applications



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